

Abstract

The present invention relates to a magnetic film having a magnetic easy axis in a pre-formed area, and a method of forming the magnetic film. Especially, the present invention relates to a method of forming a multiple magnetic easy-axis in a pre-formed magnetic film and a magnetic film having multiple easy-axis by the same method of forming the multiple easy axis. It is an object of the present invention to overcome the drawbacks of the conventional magnetic film and to achieve ultrahigh density of the unit recording cells using the magnetic film. It is another object of the present invention to suggest a method of forming a magnetic film and a magnetic film device in which the exchange interaction and the magneto-static interaction between the neighboring areas are eliminated in order to accomplish ultrahigh density for storing data. The present invention presents first, a magnetic film (or area) having a magnetic easy axis and a method of forming a magnetic easy axis on the magnetic film. The magnetic moments of the magnetic area having an easy axis are automatically aligned to the axis without an external magnetic field. This means that the magnetic moments of the magnetic area having an easy axis are strictly limited to the state in which the easy axis is same in magnitude but opposite in directions. Second, this invention presents a magnetic thin film having two neighboring areas with different direction of easy axis in each area so that the exchange interaction between the two neighboring areas is greatly reduced or eliminated.